

SEQUENCE LISTING

<110> Hastings, Gregg et al.

<120> Novel Hyaluronan-Binding Proteins and Encoding Genes

<130> PF487

<140> Unassigned

<141> 1999-12-20

<150> 60/113,871

<151> 1998-12-23

<160> 37

<170> PatentIn Ver. 2.0

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Val Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly Ile Ser Thr			
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tgc aat ggg aag ctg ctg gat gtg ctg gct gcc act gcc aac ttc tcc			5938
Cys Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala Asn Phe Ser			
1910	1915	1920	
acc ttc tat ggg atg cta ttg ggc tat gcc aat gcc acc cag cgg ggt			5986
Thr Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr Gln Arg Gly			
1925	1930	1935	
ctc gac ttc ctg gac ttc ctg gat gat gag ctc acg tat aag aca ctc			6034
Leu Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr Lys Thr Leu			
1940	1945	1950	1955
ttc gtc cct gtc aat gaa ggc ttt gtg gac aac atg acg ctg agt ggc			6082
Phe Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr Leu Ser Gly			
1960	1965	1970	
cca aac ttg gag ctg cat gcc tcc aac gcc acc ctc cta agt gcc aac			6130
Pro Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu Ser Ala Asn			
1975	1980	1985	
gcc agc cag ggg aag ttg ctt ccg gcc cac tca ggc ctc acg ctc atc			6178
Ala Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu Ser Leu Ile			
1990	1995	2000	
atc agt gac gca ggc cct gac aac agt tcc tgg gcc cct gtg gcc cca			6226
Ile Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro Val Ala Pro			
2005	2010	2015	

ggg aca gtt gtg gtt agc cgt atc att gtg tgg gac atc atg gcc ttc Gly Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile Met Ala Phe	6274
2020 2025 2030 2035	
aat ggc atc atc cat gct ctg gcc agc ccc ctc ctg gca ccc cca cag Asn Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala Pro Pro Gln	6322
2040 2045 2050	
ccc cag gca gtg ctg gcg cnt gaa gcc cca cct gtg gcg gca ggc gtg Pro Gln Ala Val Leu Ala Xaa Glu Ala Pro Pro Val Ala Ala Gly Val	6370
2055 2060 2065	
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2070 2075 2080	
ctc tac ctc cgt gcc cga ggc aag ccc atg ggc ttt ggc ttc tct gcc Leu Tyr Leu Arg Ala Arg Gly Lys Pro Met Gly Phe Gly Phe Ser Ala	6466
2085 2090 2095	
ttc cag gcg gaa gat gat gct gat gac gan ttc tca ccg tgg caa gaa Phe Gln Ala Glu Asp Asp Ala Asp Asp Xaa Phe Ser Pro Trp Gln Glu	6514
2100 2105 2110 2115	
ggg acc aac ccc acn ttg gtn tnt gtc ccc aac cct gtc ttt ggc agc Gly Thr Asn Pro Xaa Leu Xaa Xaa Val Pro Asn Pro Val Phe Gly Ser	6562
2120 2125 2130	
gac acc ttt tgt gaa ccc ttc gat gac tca ctg ctg gag gag gac ttc Asp Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu Glu Asp Phe	6610
2135 2140 2145	
cct gac acc cag agg atc ctc aca gtc aag tga cgaggctggg gctgaaaagca Pro Asp Thr Gln Arg Ile Leu Thr Val Lys	6663
2150 2155	
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35 40 45	
His Ile Leu Glu Asp Thr Arg Thr Gln Gln Thr Arg Arg Trp Trp Thr	
50 55 60	

Leu Ala Gly Gln Glu Ile Thr Val Thr Phe Asn Gln Phe Thr Lys Tyr
 65 70 75 80

Ser Tyr Lys Tyr Lys Asp Gln Pro Gln Thr Phe Asn Ile Tyr Lys
 85 90 95

Ala Asn Asn Ile Ala Ala Asn Gly Val Phe His Val Val Thr Gly Leu
 100 105 110

Arg Trp Gln Ala Pro Ser Gly Thr Pro Gly Asp Pro Lys Arg Thr Ile
 115 120 125

Gly Gln Ile Leu Ala Ser Thr Glu Ala Phe Ser Arg Phe Glu Thr Ile
 130 135 140

Leu Glu Asn Cys Gly Leu Pro Ser Ile Leu Asp Gly Pro Gly Pro Phe
 145 150 155 160

Thr Val Phe Ala Pro Ser Asn Glu Ala Val Asp Ser Leu Arg Asp Gly
 165 170 175

Arg Leu Ile Tyr Leu Phe Thr Ala Gly Leu Ser Lys Leu Gln Glu Leu
 180 185 190

Val Arg Tyr His Ile Tyr Asn His Gly Gln Leu Thr Val Glu Lys Leu
 195 200 205

Ile Ser Lys Gly Arg Ile Leu Thr Met Ala Asn Gln Val Leu Ala Val
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Asn Ile Ser Glu Glu Gly Arg Ile Leu Leu Gly Pro Glu Gly Val Pro
 225 230 235 240

Leu Gln Arg Val Asp Val Met Ala Ala Asn Gly Val Ile His Met Leu
 245 250 255

Asp Gly Ile Leu Leu Pro Pro Thr Ile Leu Pro Ile Leu Pro Lys His
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Cys Ser Glu Glu Gln His Lys Ile Val Ala Gly Ser Cys Val Asp Cys
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Gln Ala Leu Asn Thr Ser Thr Cys Pro Pro Asn Ser Val Lys Leu Asp
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Ile Phe Pro Lys Glu Cys Val Tyr Ile His Asp Pro Thr Gly Leu Asn
 305 310 315 320

Val Leu Lys Lys Gly Cys Ala Ser Tyr Cys Asn Gln Thr Ile Met Glu
 325 330 335

Gln Gly Cys Cys Lys Gly Phe Phe Gly Pro Asp Cys Thr Gln Cys Pro
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Gly Gly Phe Ser Asn Pro Cys Tyr Gly Lys Gly Asn Cys Ser Asp Gly
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Ala Cys His Ile Cys Ser Asn Pro Asn Lys His Gly Glu Gln Cys Gln
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Glu Asp Cys Gly Cys Val His Gly Leu Cys Asp Asn Arg Pro Gly Ser
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Gly Gly Val Cys Gln Gln Gly Thr Cys Ala Pro Gly Phe Ser Gly Arg
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His Cys His Leu His Ala Arg Cys Val Ser Gln Glu Gly Val Ala Arg
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Cys Arg Cys Leu Asp Gly Phe Glu Gly Asp Gly Phe Ser Cys Thr Pro
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Ser Asn Pro Cys Ser His Pro Asp Arg Gly Gly Cys Ser Glu Asn Ala
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Glu Cys Val Pro Gly Ser Leu Gly Thr His His Cys Thr Cys His Lys
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Gly Trp Ser Gly Asp Gly Arg Val Cys Val Ala Ile Asp Glu Cys Glu
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Leu Asp Val Arg Gly Gly Cys His Thr Asp Ala Leu Cys Ser Tyr Val
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Gly Tyr Gln Cys Ser Pro Ile Asp Pro Cys Arg Ala Gly Asn Gly Gly
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Cys His Gly Leu Glu Leu Glu Ala Asn Ala His Phe Ser Ile Phe Tyr
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Gln Trp Leu Lys Ser Ala Gly Ile Thr Leu Pro Ala Asp Arg Arg Val
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Thr Ala Leu Val Pro Ser Glu Ala Ala Val Arg Gln Leu Ser Pro Glu
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Asp Arg Ala Phe Trp Leu Gln Pro Arg Thr Leu Pro Asn Leu Val Arg
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Ala His Phe Leu Gln Gly Ala Leu Phe Glu Glu Leu Ala Arg Leu
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Gly Gly Gln Glu Val Ala Thr Leu Asn Pro Thr Thr Arg Trp Glu Ile
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Arg Asn Ile Ser Gly Arg Val Trp Val Gln Asn Ala Ser Val Asp Val
 675 680 685

Ala Asp Leu Leu Ala Thr Asn Gly Val Leu His Ile Leu Ser Gln Val

690	695	700
Leu Leu Pro Pro Arg Gly Asp Val Pro Gly Gly Gln Gly Leu Leu Gln		
705	710	715
720		
Gln Leu Asp Leu Val Pro Ala Phe Ser Leu Phe Arg Glu Leu Leu Gln		
725	730	735
His His Gly Leu Val Pro Gln Ile Glu Ala Ala Thr Ala Tyr Thr Ile		
740	745	750
Phe Val Pro Thr Asn Arg Ser Leu Glu Ala Gln Gly Asn Ser Ser His		
755	760	765
Leu Asp Ala Asp Thr Val Arg His His Val Val Leu Gly Glu Ala Leu		
770	775	780
Ser Met Glu Thr Leu Arg Lys Gly Gly His Arg Asn Ser Leu Leu Gly		
785	790	795
800		
Pro Ala His Trp Ile Val Phe Tyr Asn His Ser Gly Gln Pro Glu Val		
805	810	815
Asn His Val Pro Leu Glu Gly Pro Met Leu Glu Ala Pro Gly Arg Ser		
820	825	830
Leu Ile Gly Leu Ser Gly Val Leu Thr Val Gly Ser Ser Arg Cys Leu		
835	840	845
His Ser His Ala Glu Ala Leu Arg Glu Lys Cys Val Asn Cys Thr Arg		
850	855	860
Arg Phe Arg Cys Thr Gln Gly Phe Gln Leu Gln Asp Thr Pro Arg Lys		
865	870	875
880		
Ser Cys Val Tyr Arg Ser Gly Phe Ser Phe Ser Arg Gly Cys Ser Tyr		
885	890	895
Thr Cys Ala Lys Lys Ile Gln Val Pro Asp Cys Cys Pro Gly Phe Phe		
900	905	910
Gly Thr Leu Cys Glu Pro Cys Pro Gly Gly Leu Gly Gly Val Cys Ser		
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Gly His Gly Gln Cys Gln Asp Arg Phe Leu Gly Ser Gly Glu Cys His		
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Cys His Glu Gly Phe His Gly Thr Ala Cys Glu Val Cys Glu Leu Gly		
945	950	955
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Arg Tyr Gly Pro Asn Cys Thr Gly Val Cys Asp Cys Ala His Gly Leu		
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Cys Gln Glu Gly Leu Gln Gly Asp Gly Ser Cys Val Cys Asn Val Gly		
980	985	990
Trp Gln Gly Leu Arg Cys Asp Gln Lys Ile Thr Ser Pro Gln Cys Pro		
995	1000	1005

Arg Lys Cys Asp Pro Asn Ala Asn Cys Val Gln Asp Ser Ala Gly Ala
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Phe Thr Ile Phe Val Pro His Ala Asp Leu Met Ser Asn Leu Ser Gln
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Glu Gly Ser Ile Tyr Leu Asn Asp Phe Ala Arg Val Val Ser Ser Asp
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His Glu Ala Val Asn Gly Ile Leu His Phe Ile Asp Arg Val Leu Leu
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Pro Pro Glu Ala Leu His Trp Glu Pro Asp Asp Ala Pro Ile Pro Arg
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 His Arg Pro Phe Thr Met Leu Trp Pro Thr Asp Ala Ala Phe Arg Ala
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1640

1645

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 Ala Ser Phe Pro Gln Leu Ser Ala Ala Gln Gln Leu Gly Phe His Leu
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 1845 1850 1855
 Phe Pro Val Ala Asp Cys Gly Asn Gly Arg Val Gly Ile Val Ser Leu
 1860 1865 1870
 Gly Ala Arg Lys Asn Leu Ser Glu Arg Trp Asp Ala Tyr Cys Phe Arg
 1875 1880 1885
 Val Gln Asp Val Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly
 1890 1895 1900
 Ile Ser Thr Cys Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala
 905 1910 1915 1920
 Asn Phe Ser Thr Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr
 1925 1930 1935
 Gln Arg Gly Leu Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr
 1940 1945 1950

Lys Thr Leu Phe Val Pro Val Asn Glu Gly Phe Val Asn Met Thr
 1955 1960 1965

Leu Ser Gly Pro Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu
 1970 1975 1980

Ser Ala Asn Ala Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu
 985 1990 1995 2000

Ser Leu Ile Ile Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro
 2005 2010 2015

Val Ala Pro Gly Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile
 2020 2025 2030

Met Ala Phe Asn Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala
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Lys Gly His Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly
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Asp Gly His Arg Gly Gly Cys Ser Glu His Ala Asn Cys Leu Ser Thr	
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 Gly Leu Asn Thr Arg Arg Cys Glu Cys His Ala Gly Tyr Val Gly Asp
 45 50 55

gga ctg cag tgt ctg gag gag tcg gaa cca cct gtg gac cgc tgc ttg 246
 Gly Leu Gln Cys Leu Glu Glu Ser Glu Pro Pro Val Asp Arg Cys Leu
 60 65 70

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Gly Gln Pro Pro Pro Cys His Ser Asp Ala Met Cys Thr Asp Leu His
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cct tat ggt ctg aac ttt tcg gag gct gag gcg gca tgc gaa gca cag 390
 Pro Tyr Gly Leu Asn Phe Ser Glu Ala Glu Ala Ala Cys Glu Ala Gln
 105 110 115 120

gga gcc gtc ctt gct tca ttc cct cag ctc tct gct gcc cag cag ctg		438
Gly Ala Val Leu Ala Ser Phe Pro Gln Leu Ser Ala Ala Gln Gln Leu		
125	130	135
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Gly Phe His Leu Cys Leu Met Gly Trp Leu Ala Asn Gly Ser Thr Ala		
140	145	150
cac cct gtg gtt ttc cct gtg gcg gac tgt ggc aat ggt cgg gtg ggc		534
His Pro Val Val Phe Pro Val Ala Asp Cys Gly Asn Gly Arg Val Gly		
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Ile Val Ser Leu Gly Ala Arg Lys Asn Leu Ser Glu Arg Trp Asp Ala		
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tac tgc ttc cgt gtg caa gat gtg gcc tgc cga tgc cga aat ggc ttc		630
Tyr Cys Phe Arg Val Gln Asp Val Ala Cys Arg Cys Arg Asn Gly Phe		
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Val Gly Asp Gly Ile Ser Thr Cys Asn Gly Lys Leu Leu Asp Val Leu		
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gct gcc act gcc aac ttc tcc acc ttc tat ggg atg cta ttg ggc tat		726
Ala Ala Thr Ala Asn Phe Ser Thr Phe Tyr Gly Met Leu Leu Gly Tyr		
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gcc aat gcc acc cag cgg ggt ctc gac ttc ctg gac ttc ctg gat gat		774
Ala Asn Ala Thr Gln Arg Gly Leu Asp Phe Leu Asp Phe Leu Asp Asp		
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Glu Leu Thr Tyr Lys Thr Leu Phe Val Pro Val Asn Glu Gly Phe Val		
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Asp Asn Met Thr Leu Ser Gly Pro Asn Leu Glu Leu His Ala Ser Asn		
265	270	275
280		
gcc acc ctc cta agt gcc aac gcc agc cag ggg aag ttg ctt ccg gcc		918
Ala Thr Leu Leu Ser Ala Asn Ala Ser Gln Gly Lys Leu Leu Pro Ala		
285	290	295
cac tca ggc ctc agc ctc atc atc agt gac gca ggc cct gac aac agt		966
His Ser Gly Leu Ser Leu Ile Ile Ser Asp Ala Gly Pro Asp Asn Ser		
300	305	310
tcc tgg gcc cct gtg gcc cca ggg aca gtt gtg gtt agc cgt atc att		1014
Ser Trp Ala Pro Val Ala Pro Gly Thr Val Val Val Ser Arg Ile Ile		
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gtg tgg gac atc atg gcc ttc aat ggc atc atc cat gct ctg gcc agc		1062
Val Trp Asp Ile Met Ala Phe Asn Gly Ile Ile His Ala Leu Ala Ser		
330	335	340
ccc ctc ctg gca ccc cca cag ccc cag gca gtg ctg gcg cnt gaa gcc		1110
Pro Leu Leu Ala Pro Pro Gln Pro Gln Ala Val Leu Ala Xaa Glu Ala		

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365		370		375
ctt ggc ttg gtg gcc gga gct ctc tac ctc cgt gcc cga ggc aag ccc Leu Gly Leu Val Ala Gly Ala Leu Tyr Leu Arg Ala Arg Gly Lys Pro				1206
380		385		390
atg ggc ttt ggc ttc tct gcc ttc cag gcg gaa gat gat gct gat gac Met Gly Phe Gly Phe Ser Ala Phe Gln Ala Glu Asp Asp Ala Asp Asp				1254
395		400		405
gan ttc tca ccg tgg caa gaa ggg acc aac ccc acn ttg gtn tnt gtc Xaa Phe Ser Pro Trp Gln Glu Gly Thr Asn Pro Xaa Leu Xaa Xaa Val				1302
410		415		420
ccc aac cct gtc ttt ggc agc gac acc ttt tgt gaa ccc ttc gat gac Pro Asn Pro Val Phe Gly Ser Asp Thr Phe Cys Glu Pro Phe Asp Asp				1350
425	430	435		440
tca ctg ctg gag gag gac ttc cct gac acc cag agg atc ctc aca gtc Ser Leu Leu Glu Glu Asp Phe Pro Asp Thr Gln Arg Ile Leu Thr Val				1398
445		450		455
aag tga cgaggctggg gctgaaaagca gaagcatgca cagggaggag accantttta Lys				1454
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Glu His Ala Asn Cys Leu Ser Thr Gly Leu Asn Thr Arg Arg Cys Glu				35
35		40		45
Cys His Ala Gly Tyr Val Gly Asp Gly Leu Gln Cys Leu Glu Glu Ser				50
50		55		60
Glu Pro Pro Val Asp Arg Cys Leu Gly Gln Pro Pro Pro Cys His Ser				65
65		70		75
Asp Ala Met Cys Thr Asp Leu His Phe Gln Glu Lys Arg Ala Gly Val				80
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Phe His Leu Gln Ala Thr Ser Gly Pro Tyr Gly Leu Asn Phe Ser Glu				

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Ala Glu Ala Ala Cys Glu Ala Gln Gly Ala Val Leu Ala Ser Phe Pro		
115	120	125
Gln Leu Ser Ala Ala Gln Gln Leu Gly Phe His Leu Cys Leu Met Gly		
130	135	140
Trp Leu Ala Asn Gly Ser Thr Ala His Pro Val Val Phe Pro Val Ala		
145	150	155
160		
Asp Cys Gly Asn Gly Arg Val Gly Ile Val Ser Leu Gly Ala Arg Lys		
165	170	175
Asn Leu Ser Glu Arg Trp Asp Ala Tyr Cys Phe Arg Val Gln Asp Val		
180	185	190
Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly Ile Ser Thr Cys		
195	200	205
Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala Asn Phe Ser Thr		
210	215	220
Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr Gln Arg Gly Leu		
225	230	235
240		
Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr Lys Thr Leu Phe		
245	250	255
Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr Leu Ser Gly Pro		
260	265	270
Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu Ser Ala Asn Ala		
275	280	285
Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu Ser Leu Ile Ile		
290	295	300
Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro Val Ala Pro Gly		
305	310	315
320		
Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile Met Ala Phe Asn		
325	330	335
Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala Pro Pro Gln Pro		
340	345	350
Gln Ala Val Leu Ala Xaa Glu Ala Pro Pro Val Ala Ala Gly Val Gly		
355	360	365
Ala Val Leu Ala Ala Gly Ala Leu Leu Gly Leu Val Ala Gly Ala Leu		
370	375	380
Tyr Leu Arg Ala Arg Gly Lys Pro Met Gly Phe Gly Phe Ser Ala Phe		
385	390	395
400		
Gln Ala Glu Asp Asp Ala Asp Asp Xaa Phe Ser Pro Trp Gln Glu Gly		
405	410	415

Thr Asn Pro Xaa Leu Xaa Xaa Val Pro Asn Pro Val Phe Gly Ser Asp
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Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu Glu Asp Phe Pro
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Asp Thr Gln Arg Ile Leu Thr Val Lys
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<213> Homo sapiens

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Ala Ala Lys Ala Val Cys Gly Gly His Ala Thr Tyr Lys Ala Ala Arg
 35 40 45

Lys Gly His Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly
 50 55 60

Tyr Val Lys Gly Asn Cys Gly Gly Lys Thr Gly Asp Tyr Gly Arg Asn
 65 70 75 80

Arg Ser Arg Trp Asp Ala Tyr Cys Tyr Asn His Ala Lys Cys Gly Gly
 85 90 95

Val Thr Asp Lys Arg Lys Ser Gly Asn Tyr Asp Asn Cys Tyr Trp His
 100 105 110

Arg Lys Tyr Gly Arg His Ser Asp Asp Asp Asp Gly Cys Ala Asp Tyr
 115 120 125

Val Tyr Asp Ser Tyr Asp Asp Val His Gly Val Gly Arg Tyr Cys Gly
 130 135 140

Asp Asp Asp Ser Thr Gly Asn Val Met Thr Lys Ser Asp Ala Ser Val
 145 150 155 160

Thr Ala Gly Gly Lys Tyr Val Ala Met Asp Val Ser Lys Ser Ser Gly
 165 170 175

Lys Asn Thr Ser Thr Ser Thr Gly Asn Lys Asn Ala Gly Arg Ser
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atg ggc ctg ttg ctc ctg gtc cca ttg ctc ctg ctg ccc ggc tcc tac Met Gly Leu Leu Leu Leu Val Pro Leu Leu Leu Pro Gly Ser Tyr	165
1 5 10 15	
gga ctg ccc ttc tac tac ggc ttc tac tac tcc aac agc gcc aac gac Gly Leu Pro Phe Tyr Tyr Gly Phe Tyr Ser Asn Ser Ala Asn Asp	213
20 25 30	
cag aac cta ggc aac ggt cat ggc aaa gac cta cnt aat gga gtg aag Gln Asn Leu Gly Asn Gly His Gly Lys Asp Leu Xaa Asn Gly Val Lys	261
35 40 45	
ctg gtg gtg gag aca ccc gag gag acc ctg ttc acc tac caa ggg gcc Leu Val Val Glu Thr Pro Glu Glu Thr Leu Phe Thr Tyr Gln Gly Ala	309
50 55 60	
agt gtg atc ctg ccc tgc cgc tac cgc tac gag ccg gcc ctg gtc tcc Ser Val Ile Leu Pro Cys Arg Tyr Arg Tyr Glu Pro Ala Leu Val Ser	357
65 70 75 80	
ccg cgg cgt gtg cgt gtc aaa tgg tgg aag ctg tcg gag aac ggg gcc Pro Arg Arg Val Arg Val Lys Trp Trp Lys Leu Ser Glu Asn Gly Ala	405
85 90 95	
cca gag aag gac gtg ctg gtg gcc atc ggg ctg agg cac cgc tcc ttt Pro Glu Lys Asp Val Leu Val Ala Ile Gly Leu Arg His Arg Ser Phe	453
100 105 110	
ggg gac tac caa ggc cgc gtg cac ctg cgg cag gac aaa gag cat gac Gly Asp Tyr Gln Gly Arg Val His Leu Arg Gln Asp Lys Glu His Asp	501
115 120 125	
gtc tcg ntg gag atc cag gnt ctg cgg ctg gag gac tat ggg cgt tac Val Ser Xaa Glu Ile Gln Xaa Leu Arg Leu Glu Asp Tyr Gly Arg Tyr	549
130 135 140	
cgc tgt gag gtc atn gac ggg ctg gag gat gaa agc ggt ctg gtg gag Arg Cys Glu Val Xaa Asp Gly Leu Glu Asp Glu Ser Gly Leu Val Glu	597
145 150 155 160	
ctg gag ctg cgg ggt gtg gtc ttt cct tac cag tcc ccc aac ggg cgc Leu Glu Leu Arg Gly Val Val Phe Pro Tyr Gln Ser Pro Asn Gly Arg	645
165 170 175	
tac cag ttc aac ttc cac gag ggc cag cag gtc tgt gca gag cag gct Tyr Gln Phe Asn Phe His Glu Gly Gln Gln Val Cys Ala Glu Gln Ala	693
180 185 190	
gcg gtg gtg gcc tcc ttt gag cag ctc ttc cgg gcc tgg gag gag ggc Ala Val Val Ala Ser Phe Glu Gln Leu Phe Arg Ala Trp Glu Glu Gly	741
195 200 205	
ctg gac tgg tgc aac gcg ggc tgg ctg cag gat gcc acg gtg cag tac Leu Asp Trp Cys Asn Ala Gly Trp Leu Gln Asp Ala Thr Val Gln Tyr	789
210 215 220	
ccc atc atg ttg ccc cgg cag ccc tgc ggt ggc ccg gac ctg gca cct	837

Pro Ile Met Leu Pro Arg Gln Pro Cys Gly Gly Pro Asp Leu Ala Pro			
225	230	235	240
ggc gtg cga agc tac ggc ccc cgc cac cgc ctg cac cgc tat gat			885
Gly Val Arg Ser Tyr Gly Pro Arg His Arg Arg Leu His Arg Tyr Asp			
245	250	255	
gta ttc tgc ttc gct act gcc ctc arg ggg cggtac tac ctg gan			933
Val Phe Cys Phe Ala Thr Ala Leu Xaa Gly Arg Val Tyr Tyr Leu Xaa			
260	265	270	
cac cct gag aan ctg acn ctg aca naa gca agg gaa gcc tgc caa gaa			981
His Pro Glu Xaa Leu Xaa Leu Thr Xaa Ala Arg Glu Ala Cys Gln Glu			
275	280	285	
aaa t			985
Lys			
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20	25	30	
Gln Asn Leu Gly Asn Gly His Gly Lys Asp Leu Xaa Asn Gly Val Lys			
35	40	45	
Leu Val Val Glu Thr Pro Glu Glu Thr Leu Phe Thr Tyr Gln Gly Ala			
50	55	60	
Ser Val Ile Leu Pro Cys Arg Tyr Arg Tyr Glu Pro Ala Leu Val Ser			
65	70	75	80
Pro Arg Arg Val Arg Val Lys Trp Trp Lys Leu Ser Glu Asn Gly Ala			
85	90	95	
Pro Glu Lys Asp Val Leu Val Ala Ile Gly Leu Arg His Arg Ser Phe			
100	105	110	
Gly Asp Tyr Gln Gly Arg Val His Leu Arg Gln Asp Lys Glu His Asp			
115	120	125	
Val Ser Xaa Glu Ile Gln Xaa Leu Arg Leu Glu Asp Tyr Gly Arg Tyr			
130	135	140	
Arg Cys Glu Val Xaa Asp Gly Leu Glu Asp Glu Ser Gly Leu Val Glu			
145	150	155	160
Leu Glu Leu Arg Gly Val Val Phe Pro Tyr Gln Ser Pro Asn Gly Arg			
165	170	175	
Tyr Gln Phe Asn Phe His Glu Gly Gln Gln Val Cys Ala Glu Gln Ala			

180

185

190

Ala Val Val Ala Ser Phe Glu Gln Leu Phe Arg Ala Trp Glu Glu Gly
 195 200 205

Leu Asp Trp Cys Asn Ala Gly Trp Leu Gln Asp Ala Thr Val Gln Tyr
 210 215 220

Pro Ile Met Leu Pro Arg Gln Pro Cys Gly Gly Pro Asp Leu Ala Pro
 225 230 235 240

Gly Val Arg Ser Tyr Gly Pro Arg His Arg Arg Leu His Arg Tyr Asp
 245 250 255

Val Phe Cys Phe Ala Thr Ala Leu Xaa Gly Arg Val Tyr Tyr Leu Xaa
 260 265 270

His Pro Glu Xaa Leu Xaa Leu Thr Xaa Ala Arg Glu Ala Cys Gln Glu
 275 280 285

Lys

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Gln Glu Glu Asn Gly Pro Arg Leu Leu Val Val Ala Glu Gln Ala Lys
 35 40 45

Ile Phe Ser Gln Arg Gly Gly Asn Val Thr Leu Pro Cys Lys Phe Tyr
 50 55 60

His Glu His Thr Ser Thr Ala Gly Ser Gly Thr His Lys Ile Arg Val
 65 70 75 80

Lys Trp Thr Lys Leu Thr Ser Asp Tyr Leu Lys Glu Val Asp Val Phe
 85 90 95

Val Ala Met Gly His His Arg Lys Ser Tyr Gly Lys Tyr Gln Gly Arg
 100 105 110

Val Phe Leu Arg Glu Ser Ser Glu Asn Asp Ala Ser Leu Ile Ile Thr
 115 120 125

Asn Ile Met Leu Glu Asp Tyr Gly Arg Tyr Lys Cys Glu Val Ile Glu
 130 135 140

Gly Leu Glu Asp Asp Thr Ala Val Val Ala Leu Asn Leu Glu Gly Val
 145 150 155 160

Val Phe Pro Tyr Ser Pro Arg Leu Gly Arg Tyr Asn Leu Asn Phe His
 165 170 175
 Glu Ala Gln Gln Ala Cys Leu Asp Gln Asp Ser Ile Ile Ala Ser Phe
 180 185 190
 Asp Gln Leu Tyr Glu Ala Trp Arg Ser Gly Leu Asp Trp Cys Asn Ala
 195 200 205
 Gly Trp Leu Ser Asp Gly Ser Val Gln Tyr Pro Ile Thr Lys Pro Arg
 210 215 220
 Glu Pro Cys Gly Gly Lys Asn Thr Val Pro Gly Val Arg Asn Tyr Gly
 225 230 235 240
 Phe Trp Asp Lys Glu Arg Ser Arg Tyr Asp Val Phe Cys Phe Thr Ser
 245 250 255
 Asn Phe Asn Gly Arg Phe Tyr Tyr Leu Ile His Pro Thr Lys Leu Thr
 260 265 270
 Tyr Asp Glu Ala Val Gln Ala Cys Leu Lys Asp Gly Ala Gln Ile Ala
 275 280 285
 Lys Val Gly Gln Ile Phe Ala Ala Trp Lys Leu Leu Gly Tyr Asp Arg
 290 295 300
 Cys Asp Ala Gly Trp Leu Ala Asp Gly Ser Val Arg Tyr Pro Ile Ser
 305 310 315 320
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gacgggcaca gctgcacaga gatagacccc tgtgcagacg gccttaacgg agggtgtc 180
gagcacgcca cctgtaag atg aca ggc ccg ggc aag cac aag tgt gag tgt 231
          Met Thr Gly Pro Gly Lys His Lys Cys Glu Cys
          1           5            10

aaa agt cac tat gtc gga gat ggg ctg aac tgt gag ccg gag cag ctg 279
Lys Ser His Tyr Val Gly Asp Gly Leu Asn Cys Glu Pro Glu Gln Leu
          15          20            25

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ccc att gac cgc tgc tta cag gac aat ggg cag tgc cat gca gac gcc Pro Ile Asp Arg Cys Leu Gln Asp Asn Gly Gln Cys His Ala Asp Ala	327
30 35 40	
aaa tgt gtc gac ctc cac ttc cag gat acc act gtt ggg gtg ttc cat Lys Cys Val Asp Leu His Phe Gln Asp Thr Thr Val Gly Val Phe His	375
45 50 55	
cta cgc tcc cca ctg ggc cag tat aag ctg acc ttt gac aaa gcc aga Leu Arg Ser Pro Leu Gly Gln Tyr Lys Leu Thr Phe Asp Lys Ala Arg	423
60 65 70 75	
gag gcc tgt gcc aac gaa gct gcg acc atg gca acc tac aac cag ctc Glu Ala Cys Ala Asn Glu Ala Ala Thr Met Ala Thr Tyr Asn Gln Leu	471
80 85 90	
tcc tat nnc cag aag gcc aag tac cac ctg tgc tca gca ggc tgg ctg Ser Tyr Xaa Gln Lys Ala Lys Tyr His Leu Cys Ser Ala Gly Trp Leu	519
95 100 105	
gag acc ggg cgg gtt gcc tac ccc aca gcc ttc gcc tcc cag aac tgt Glu Thr Gly Arg Val Ala Tyr Pro Thr Ala Phe Ala Ser Gln Asn Cys	567
110 115 120	
ggc tct ggt gtg gtt ggg ata gtg gac tat gga cct aga ccc aac aag Gly Ser Gly Val Val Gly Ile Val Asp Tyr Gly Pro Arg Pro Asn Lys	615
125 130 135	
agt gaa atg tgg gat gtc ttc tgc tat cgg atg aaa gat gtg aac tgc Ser Glu Met Trp Asp Val Phe Cys Tyr Arg Met Lys Asp Val Asn Cys	663
140 145 150 155	
acc tnc aag gtg ggc tat gtg gga gat ggc ttc tca tac agt ggg aac Thr Xaa Lys Val Gly Tyr Val Gly Asp Gly Phe Ser Tyr Ser Gly Asn	711
160 165 170	
ctg ctg cag gtc ctg atg tcc ttc ccc tca ctc aca aac ttc ctg acg Leu Leu Gln Val Leu Met Ser Phe Pro Ser Leu Thr Asn Phe Leu Thr	759
175 180 185	
gaa gtg ctg gcc tat tcc aac agc tca gct cga ggc cgt gca ttt cta Glu Val Leu Ala Tyr Ser Asn Ser Ala Arg Gly Arg Ala Phe Leu	807
190 195 200	
gaa cac ctg act gac ctg tcc atc cgc ggc acc ctc ttt gtn cca cag Glu His Leu Thr Asp Leu Ser Ile Arg Gly Thr Leu Phe Xaa Pro Gln	855
205 210 215	
aac agt ggg ctg ggg gag aat gag acc ttg tct ggg cgg gac atc gag Asn Ser Gly Leu Gly Glu Asn Glu Thr Leu Ser Gly Arg Asp Ile Glu	903
220 225 230 235	
cac cac ctc gcc aat gtc agc atg ttt ttc tac aat gac ctt gtc aat His His Leu Ala Asn Val Ser Met Phe Phe Tyr Asn Asp Leu Val Asn	951
240 245 250	
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255

260

265

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 270 275 280

gac act ctg gag tgg gac atc tgt gcc tcc aat ggg atc aca cat gtc 1095
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 Thr Xaa Leu Gly Xaa Gly Ile Phe Xaa Xaa Ile Ile Leu Val Thr Gly
 320 325 330

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His Phe Gln Asp Thr Thr Val Gly Val Phe His Leu Arg Ser Pro Leu
 50 55 60

Gly Gln Tyr Lys Leu Thr Phe Asp Lys Ala Arg Glu Ala Cys Ala Asn
 65 70 75 80

Glu Ala Ala Thr Met Ala Thr Tyr Asn Gln Leu Ser Tyr Xaa Gln Lys
 85 90 95

Ala Lys Tyr His Leu Cys Ser Ala Gly Trp Leu Glu Thr Gly Arg Val
 100 105 110

Ala Tyr Pro Thr Ala Phe Ala Ser Gln Asn Cys Gly Ser Gly Val Val
 115 120 125

Gly Ile Val Asp Tyr Gly Pro Arg Pro Asn Lys Ser Glu Met Trp Asp
 130 135 140

Val Phe Cys Tyr Arg Met Lys Asp Val Asn Cys Thr Xaa Lys Val Gly
 145 150 155 160
 Tyr Val Gly Asp Gly Phe Ser Tyr Ser Gly Asn Leu Leu Gln Val Leu
 165 170 175
 Met Ser Phe Pro Ser Leu Thr Asn Phe Leu Thr Glu Val Leu Ala Tyr
 180 185 190
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 195 200 205
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 210 215 220
 Glu Asn Glu Thr Leu Ser Gly Arg Asp Ile Glu His His Leu Ala Asn
 225 230 235 240
 Val Ser Met Phe Phe Tyr Asn Asp Leu Val Asn Gly Thr Thr Leu Gln
 245 250 255
 Thr Arg Leu Gly Ser Lys Leu Leu Ile Thr Asp Arg Gln Asp Pro Leu
 260 265 270
 His Pro Thr Glu Thr Arg Cys Val Asp Gly Arg Asp Thr Leu Glu Trp
 275 280 285
 Asp Ile Cys Ala Ser Asn Gly Ile Thr His Val Ile Ser Arg Xaa Leu
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 Lys Ala Pro Pro Ala Pro Val Thr Leu Xaa His Thr Xaa Leu Gly Xaa
 305 310 315 320
 Gly Ile Phe Xaa Xaa Ile Ile Leu Val Thr Gly Ala Val Ala Leu Ala
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 35 40 45

Leu Thr Tyr Ala Glu Ala Lys Ala Val Cys Glu Phe Glu Gly Gly Arg
 50 55 60

Leu Ala Thr Tyr Lys Gln Leu Glu Ala Ala Arg Lys Ile Gly Phe His
 65 70 75 80

Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly Tyr Pro Ile
 85 90 95

Val Lys Pro Gly Pro Asn Cys Gly Phe Gly Lys Thr Gly Ile Ile Asp
 100 105 110

Tyr Gly Ile Arg Leu Asn Arg Ser Glu Arg Trp Asp Ala Tyr Cys Tyr
 115 120 125

Asn Pro His Ala Lys Glu Cys Gly Gly Val Phe Thr Asp Pro Lys Arg
 130 135 140

Ile Phe Lys Ser Pro Gly Phe Pro Asn Glu Tyr Asp Asp Asn Gln Val
 145 150 155 160

Cys Tyr Trp His Ile Arg Leu Lys Tyr Gly Gln Arg Ile His Leu Ser
 165 170 175

Phe Leu Asp Phe Asp Leu Glu His Asp Pro Gly Cys Leu Ala Asp Tyr
 180 185 190

Val Glu Ile Tyr Asp Ser Tyr Asp Asp Val His Gly Phe Val Gly Arg
 195 200 205

Tyr Cys Gly Asp Glu Leu Pro Glu Asp Ile Ile Ser Thr Gly Asn Val
 210 215 220

Met Thr Leu Lys Phe Leu Ser Asp Ala Ser Val Thr Ala Gly Gly Phe
 225 230 235 240

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Ser His Leu
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44

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